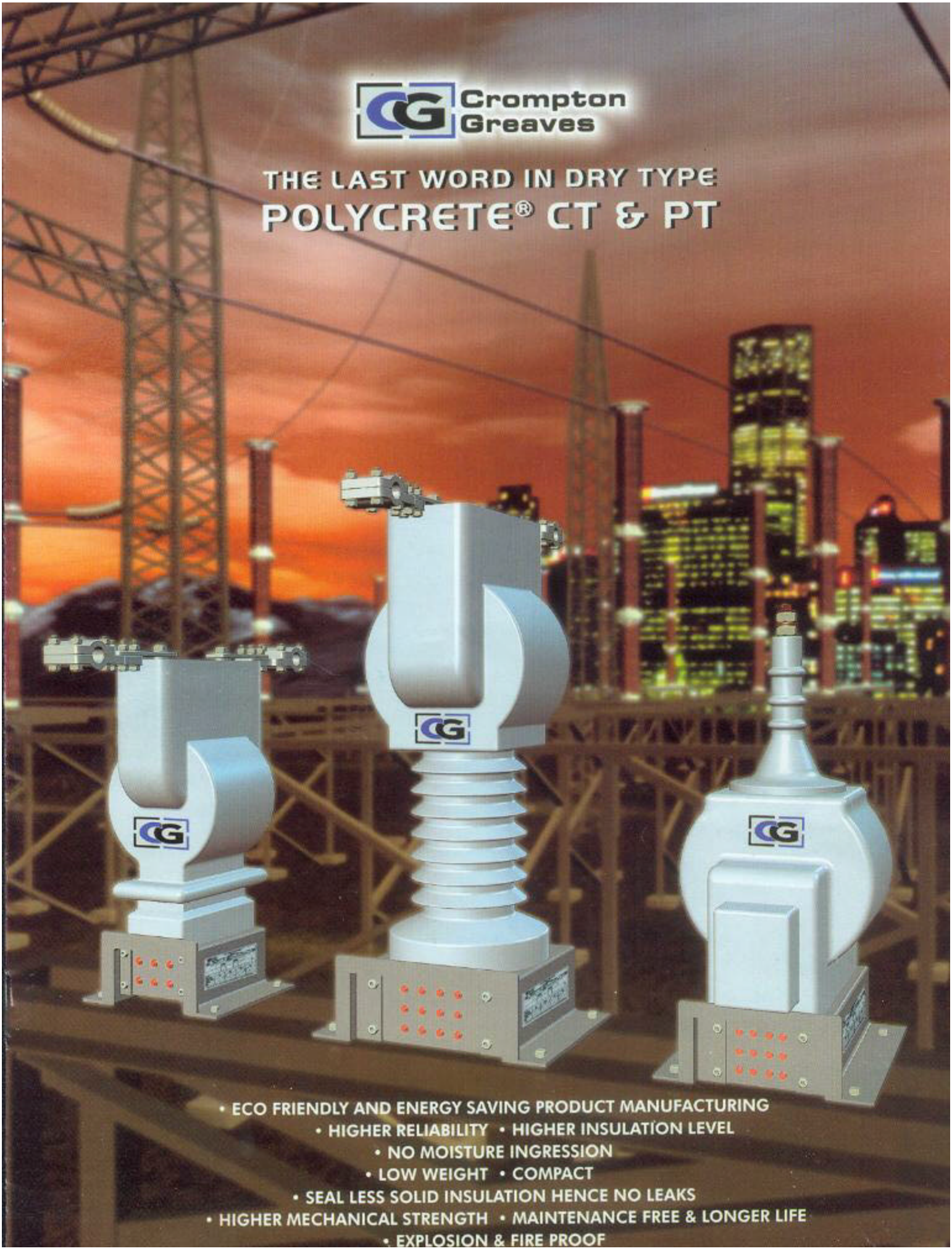

Crompton Greaves
THE LAST WORD IN DRY TYPE
POLYCRETE® CT & PT
• ECO FRIENDLY AND ENERGY SAVING PRODUCT MANUFACTURING
• HIGHER RELIABILITY • HIGHER INSULATION LEVEL
• NO MOISTURE INGRESSION
• LOW WEIGHT • COMPACT
• SEAL LESS SOLID INSULATION HENCE NO LEAKS
• HIGHER MECHANICAL STRENGTH • MAINTENANCE FREE & LONGER LIFE
• EXPLOSION & FIRE PROOF

Expressions of Power

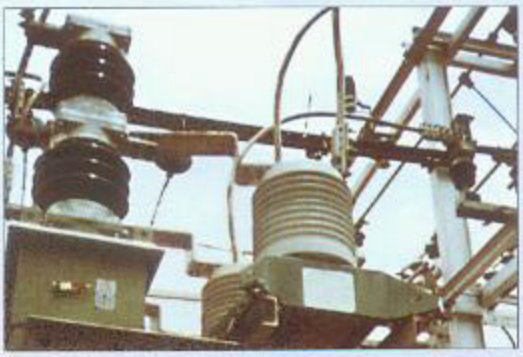
Crompton Greaves has been engineering Power Systems since its inception in 1937, and has led innovations in the Power industry ever since. From Service Capabilities, to Project Engineering to Performance Solutions, there is not an aspect of Power Delivery System, Energy Usage, Monitoring and Control, or Economics and Business decisions that Crompton Greaves does not have expertise in. Crompton Greaves is extensively engaged in manufacturing, marketing and turnkey project operations. The Company offers one of the widest spectrum of products, systems and services to fulfill almost every need through four Business Groups and has a leadership in most of its product lines.

Power Systems
Industrial Systems
Consumer Products
Digital

Switchgear (A part of Power Systems)

Crompton Greaves offer the widest range of Switchgear to meet the requirements of electrical substations for effective measurement, control and management of power in utility, industrial, urban and rural installations.

The product range includes : Vacuum Circuit Breakers, SF6 Circuit Breakers & Panels, SF6 Ring Main Units, Lighting Arresters, Vacuum Interrupters, MV & LT Vacuum Contactors, **Voltage & Current Transformers**, Condensor, Bushings, On - load Tap Chargers. This catalogue furnishes the details of the "**Polycrete® Current & Voltage Transformers**".



FIELD PERFORMANCE OF POLYMER CONCRETE PRODUCTS WORLD WIDE AND IN INDIAN UTILITIES

Polymer concrete has been extensively used in the United States of America and other developed countries for insulation upto extra high voltage class since 1975.

Crompton Greaves started manufacturing 11kV & 33kV Outdoor Current & Potential Transformers since 1995. These products are performing at various locations and in different site conditions. These products and product manufacturing process are patented by CG in India.

The typical site problems with conventional CT/PTs are illustrated below. The Polycrete® products are free from these problems.

Corrosion of steel hardwares ◀

Transit Damages ▶

Shattering Tendency ◀

Oil Leakage ▶

POLYCRETE® A BREAKTHROUGH IN DRY TYPE OUTDOOR INSULATION

Insulating materials play a vital role in equipments used in safe transmission and distribution of electrical power. Porcelain and glass (inorganic materials) are used as a major outdoor insulating materials in various applications such as string insulators, post insulators and bushings etc. But these materials have several practical limitations. Porcelain/Glass insulators are not showing a steady trend in the price levels over the past years, and this may still tend to rise. Hence the organic outdoor insulators e.g. Polymer Concrete are considered as cost effective alternative to porcelain/glass insulators.

Polycrete® is a high performance, composite insulation material developed by Crompton Greaves and has excellent electrical and mechanical properties, ideally suited for both outdoor and indoor insulation applications.

Polycrete® and polycrete® products have been extensively tested in-house, at external laboratories and at field installations worldwide with onerous ambient conditions.

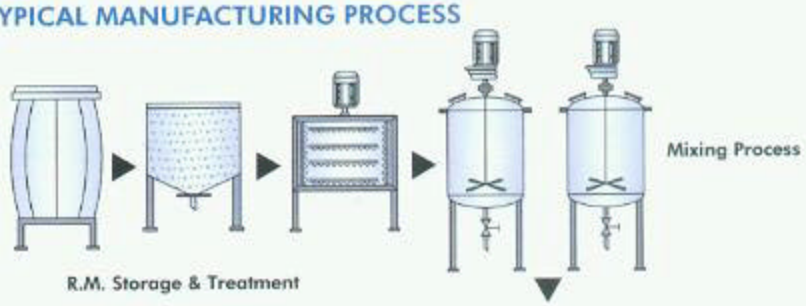
MAJOR ADVANTAGES OF POLYCRETE® PRODUCTS

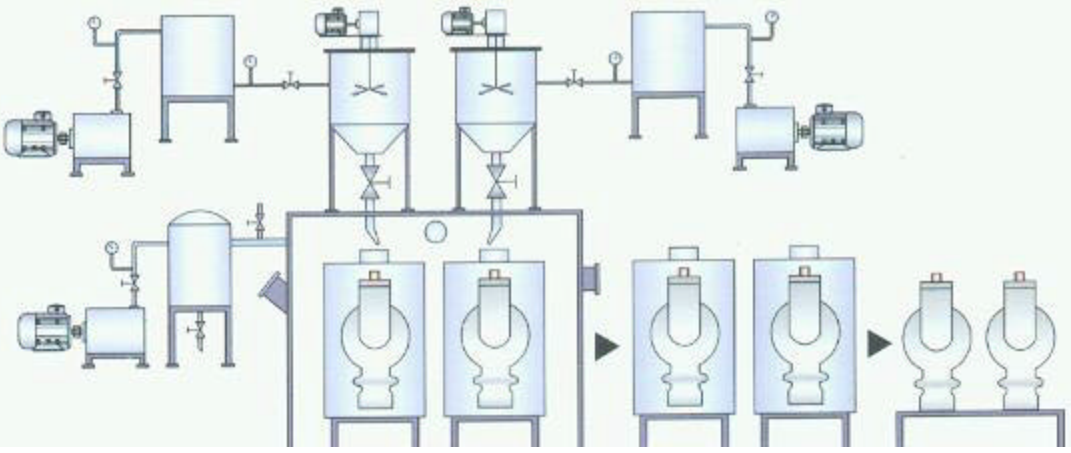
- **Low energy cost and pollution free process**
- **No hardware and fittings required**
- **Good dimensional stability**
- **Shatterproof**

STATE OF ART MANUFACTURING PROCESS

Polycrete® products are manufactured by binding the selected grades of silica and a low viscosity resins. The products are vacuum cast in a controlled process parameters.

A TYPICAL MANUFACTURING PROCESS





RESEARCH AND DEVELOPMENT

Crompton Greaves promotes a high level of Research and Development activities to maintain a technological lead and competitive advantage. R & D operations are structured to initiate a techno-active response right through the company, getting research out of the labs in to the products. Numerous awards and ISO 9000 certifications have accredited the exacting standards of quality management.

Crompton Greaves has an extensive R & D facilities with the pilot batch manufacturing plants to carry out the continuous improvements in the products.

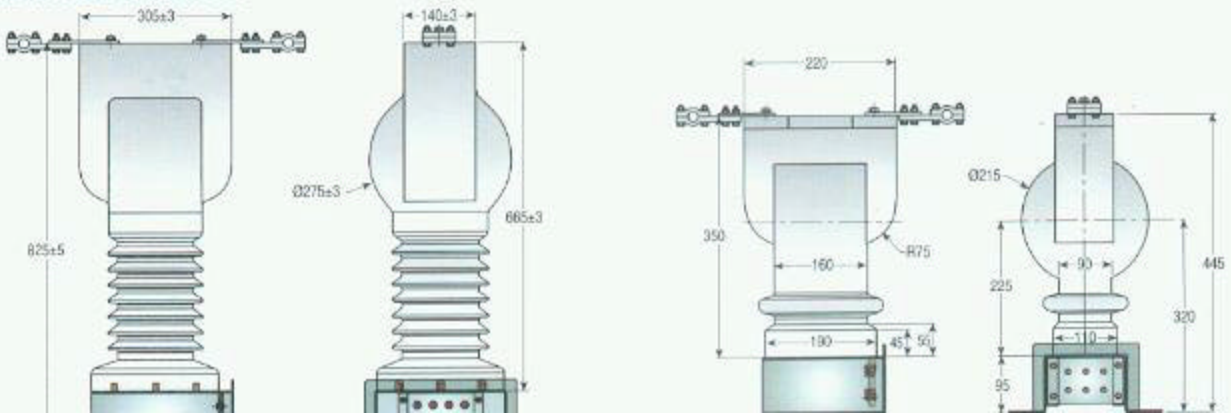
The test facilities in R & D include short circuit, high voltage/ high current, material analysis laboratories etc. The products developed by R & D are regularly type tested in these laboratories for various parameter. The products are fully evaluated for the reliability before offering to the customer.

TECHNICAL SPECIFICATION FOR POLYCRETE® OUTDOOR CTs & PTs (FULLY TYPE TESTED)

Parameters	CT		PT	
Highest System Voltage (Um)	12 kV	36 kV	12 kV	36 kV
Nominal System Voltage (Un)	11 kV	33 kV	11 kV	33 kV
Type Designation Series	PCCT-11	PCCT-33	PCVT-11	PCVT-33
Applicable Standards	IS 2705 (1992), IEC 60044.1 (1996)		IS 3156 (1992), IEC 186 (1987)	
Partial Discharge Level (pc)	Within Limits As Specified In Standards			
Ratio Selection	By Primary Reconnection or By Secondary Tapping		Secondary Tapping	
Min. Creepage Distance in mm/kV	>31			
Min. Arcing Distance in mm	330	560	330	560
Primary Terminals	Suitable For Bolt Horizontal & Vertical Take Off			
Rated Voltage Factor	N/A	N/A	1.2 Continuous & 1.5 For 30 Sec.	
Total Wt. in Kg. (Approx.)	25	45	25	50

Rated short time current, rated continuous thermal current, number of core, output & accuracy class can be given as per the requirement.

THE TYPICAL CT DESIGNS



FREQUENTLY ASKED QUESTIONS ON POLYCRETE PRODUCTS

Properties Of Materials

➤
- Density = 2.1 gm/cc (Typical)
- Compressive Strength = > 15000 psi
- Dielectric Strength = 15kV/mm
- Comparative tracking index = > 600V as per IEC-112
- Max continious working temperature & insulation class = 110°C & Class "B"
- Moisture absorption coefficient = 0.105% (Tested for 240 Hrs @ 23°C for ASTM D-570-77)
- Compatibility to transformer oil & capacitor oil = Yes
- Arc resistance > 252.5 Sec.
- Flame proofness : Yes as per IS 9431-1979

- How is the Inter material Thermal expansion & contraction taken care in the Polycrete® clad products?

➤ A coating of polymeric solution with sufficient thickness is applied on the outer surface before casting into the Polycrete®. The coefficient of thermal expansion matches with hardware within the operating temperature to avoid mechanical stress.

- Does the casting into the Polycrete® help/ oppose the explosion of the assy any experience in the above context?

➤ Polycrete® is anti vibration material, hence, it reduces the danger of explosion hazard of Vacuum Interrupter. Polycrete® CTs are in operation for over 8 years in India more than 10,000 nos. No case of shatter reported.

Design Parameters

- How is the temperature cycle with standability of polycrete products?

➤ Test conducted succesfully as per IS 9431:1979 (with the test temperatures of 0°C & 90°C)

- What is the derating coefficient of Polycrete® embedded conductor?

➤ No derating factor is required to be applied.

- What is the minimum casting thickness?

➤ It is design dependent, no specific limit.

- Partial discharge values (general) as compared to porcelain as an insulator.

➤ PD behaviour of Polycrete® is extremely good, being essentially inorganic system.

Process

- How flowable the material is ? (to achieve the intricate shapes e.g. housing etc.)

➤ Sufficiently flowable to provide shed profiles. It is a proprietary manufacturing process.

- What is the active working life and what is the shelf life of the material (after casting)?

➤ The material has very long life (over 20 years).

Asthetics, Weatherability & General

- How do you prove outdoor worthyness of the material?

➤ Salt fog test conducted at CPRI India successfully. In addition, UV tests and natural weathering data for over 8 years is found satisfactory.

- What is the Surface Finish achievable?

➤ Surface finish comparable to the resin cast indoor insulators can be achieved. The value will be better than 10 micron.

- Is the material environment friendly?

➤ Very much, the scrap is inert and compatible with the environment.

- What is the rate of decomposition of the material in the outdoor field?

➤ Proven through test for about 10 years. No noticeable degradation of the material systems.

- Please provide the reports of type tests, satisfactory performance in India or abroad.

➤ Polycrete® CTs in operation for over 5 years in India. Type test reports of CTs tested at CPRI, available.

- Seismic test?

➤ Yes, conducted for 0.5g value.

- Since when the material is in use for insulating products?

➤ Since 1975 in U.S.

- Why the global market is not demanding only Polycrete®?

➤ The solid (dry) insulating are becoming popular day by day worldwide for the eco & energy needs. The polymer concrete &

OTHER POTENTIAL APPLICATIONS OF THE POLYCRETE® MATERIAL

Support insulators upto 132kV, Cable box bushings, Capacitor bushings, Transformer bushings, Outdoor Vacuum Interrupters, Distribution transformers etc.

Crompton Greaves

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